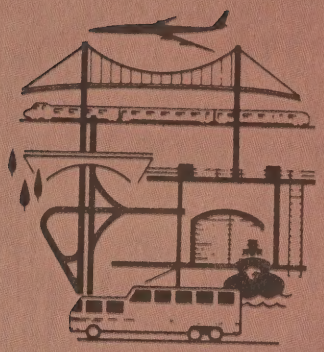
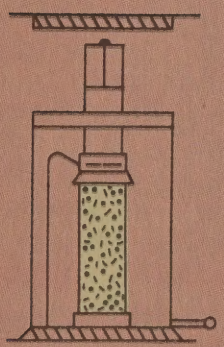
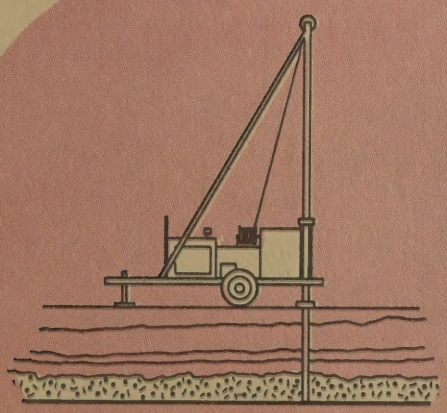
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

RAYMOND T. SCHULER, COMMISSIONER

SOIL MECHANICS BUREAU







TEST WELL REPORT
FIVE RIVERS
CONSERVATION EDUCATION CENTER
DELMAR, NEW YORK

MAY 1974

SM 238b (1/73)

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
Raymond T. Schuler, Commissioner

1220 Washington Avenue, State Campus, Albany, New York 12226

May 15, 1974

Mr. Robert Proctor
Dept. of Environmental Conservation
Bureau of Facilities & Construction Management
Room 601
50 Wolf Road
Albany, New York 12205

SUBJECT: Water Well Development
Five Rivers Conservation
Education Center
Albany County
P.I.N. E103.00-701

Dear Sir:

As requested by your General Engineering Department, this Bureau has completed inspection of the development of the well at the subject location. Attached is a report by Mr. V. Bryant containing his observations and opinions of the well development and its future use.

We concur with Mr. Bryants comments.

Very truly yours,

L. H. Moore, Director
Soil Mechanics Bureau

By

W. P. Moody

W. P. Moody
Associate Soils Engineer

WPM:TED:SAS
Attachment

NYSDOT
Library
50 Wolf Road, POD 34
Albany, New York 12232

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU

TEST WELL REPORT
FOR

FIVE RIVERS

CONSERVATION EDUCATION CENTER

DELMAR, NEW YORK

By

Vance Bryant
Senior Engineering Geologist

May 1974

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

DATE May 8, 1974

SUBJECT WELL CONSTRUCTION
FIVE RIVERS CONSERVATION EDUCATION CENTER
ALBANY COUNTY, P.I.N. E103.00-701

FROM Vance Bryant, Senior Engineering Geologist

TO W. P. Moody, Associate Soils Engineer

At the request of the Bureau of General Engineering, Department of Environmental Conservation, representatives of this Bureau were in charge of field inspection for new well construction at the Five Rivers facility at Delmar, New York. Mr. R. Brito was present during drilling of the well and the writer during testing of the well.

The well was progressed through clay overburden to a depth of eighty-one feet. At this point a mixture of clay and angular gravel size fragments were encountered. This material was designated "hardpan" by the driller on the basis of its drillability. As the well was progressed the "hardpan" was penetrated and a layer of sand and gravel was encountered. This relatively thin layer, two feet (±), was water bearing and was located immediately upon shale bedrock at a depth of ninety feet. The well was progressed three feet into bedrock.

Due to the nature and thickness of the unconsolidated strata it was decided not to attempt to screen the aquifer but to place sand and gravel within the casing and bump the casing back to expose the sand and gravel to the aquifer. This was accomplished and development proceeded. A twenty-four hour pump test was then performed starting at a pumping rate of 15 gallons per minute. During the pumping period it was found necessary to reduce the rate in order to obtain a stable and satisfactory drawdown. The water cleared during this period and samples were taken and submitted to a laboratory for testing of water quality (see results in Appendix).

On the basis of the pump test and the writer's previous experience it was considered advantageous to proceed with additional testing. Mr. Robert Proctor of the Department of Environmental Conservation was contacted and the situation explained to him. Since expenditures on the well were

within the Contract limits permission was given to proceed with the testing.

The additional testing was performed on April 23 and 24 at a pumping rate of ten and fifteen gallons per minute. On the basis of the test results it was determined that the well will produce somewhere between ten and fifteen G.P.M. at a satisfactory drawdown. Rather than attempting to determine more accurately the exact maximum rate, i. e. 12, 13, etc. G.P.M. several factors dictate that a maximum rate of ten G.P.M. be recommended for this well. These factors are as follows:

1. Because of the nature of the well finish (open end pipe) the pump should be placed as far off the bottom as practical.

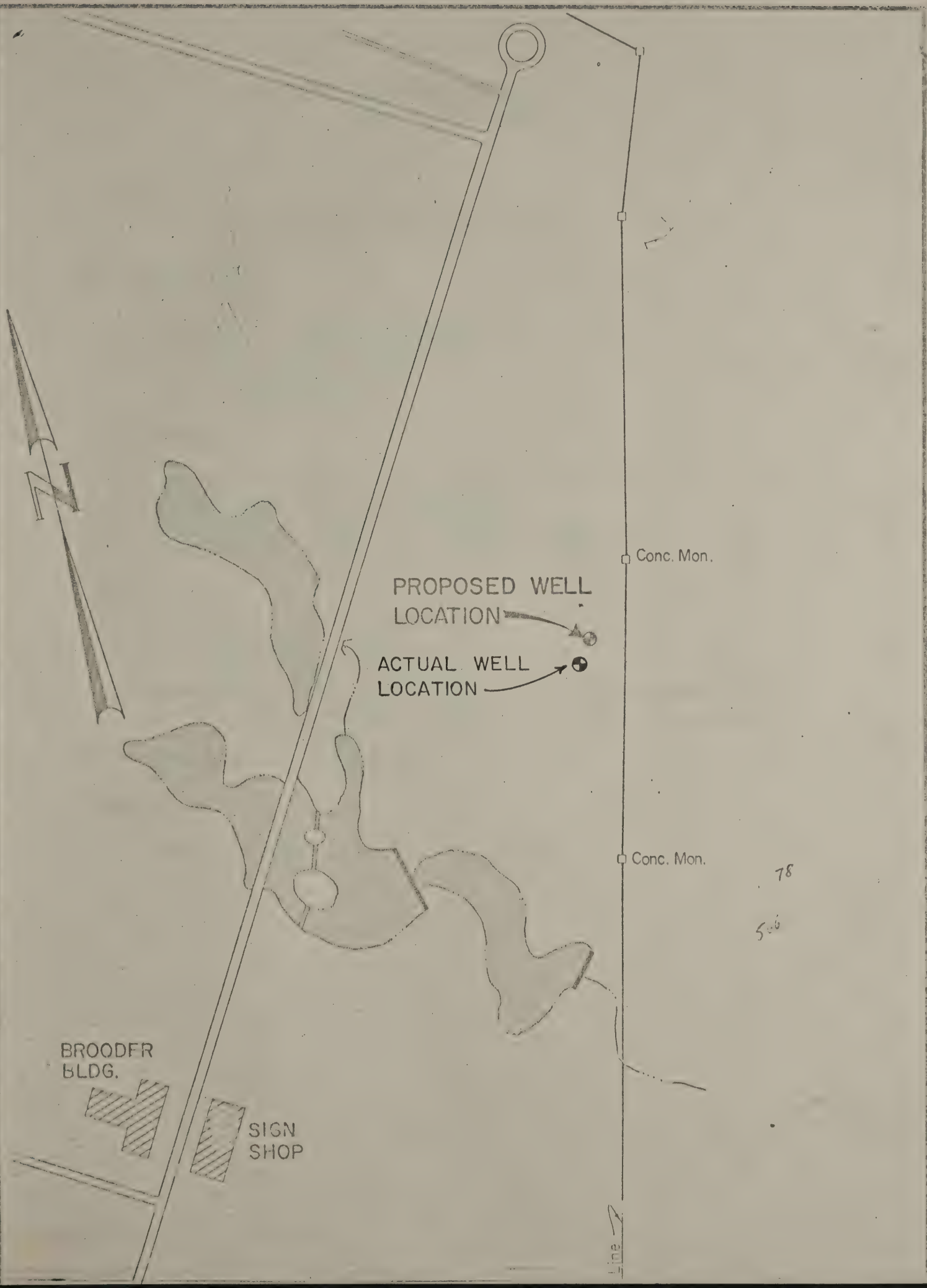
2. The pump tests indicate that the water level will not become completely stable but will continue to drop at an uneven rate as water is drawn from the aquifer. This indicates that the aquifer is either not uniform in thickness and/or extent, and that recharge to the well will be somewhat inconsistent.

3. The pump test of April 23 (see Appendix) indicates that the well will yield water at a rate of 10 G.P.M. over at least a seven hour period with a drawdown of approximately 10 feet.

A pumping rate of ten G.P.M. is recommended and will allow the pump to be placed twenty-five feet off the bottom of the well with twenty-five feet of water remaining over the pump while it is in operation.

At such time that the exact needs of the Five Rivers facility are determined a pump cycle and storage requirement can be determined. Should further testing be required or considered advantageous in order to extend the cycle (time) and/or reduce storage requirements this office can be contacted for recommendations or to participate. It is stressed, however, that in any case, the pumping rate of ten G.P.M. not be exceeded without further consultation.

APPENDIX


N
PROPOSED WELL LOCATION
ACTUAL WELL LOCATION
Conc. Mon.
Conc. Mon.
BROODER BLDG.
SIGN SHOP
Line

FIVE RIVERS CONSERVATION EDUCATION CENTER
DELMAR, NEW YORK

Location

See Location Plan included in Report

Drilling Data

Contractor: Dick Ferraioli, Inc.
Driller : Dick Ferraioli
Date Started: 4/4/74
Date Completed:4/8/74

Well Data

Source of Water: Sand and Gravel
Overburden: Clay and Glacial Till
Static Level During Drilling: 30 Feet (±)
Depth of Well: 93 Feet below Ground.

Test Data

Date Started: 4/19/74
Date Completed: 4/24/74
Location of Pump Intake: 83.5 Feet below Ground
Static Level During Testing: 28-29 Feet below Ground
Yield: 10 G.P.M.
Drawdown: 9.5 Feet (±)

Pump Data

Make and Type: Valley 3 HP Submersible

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DELMAR, NEW YORK

WELL LOG	WELL DETAILS
	3' — Top of Casing
Topsoil	Original Ground
Brown Clay 0-14 Feet	
Transition Area Brown to Gray Clay	
	Static Level During Testing 28-29 Feet Below Ground
	Dynamic Level (Rate-10 G.P.M.) 37 2/3 Feet Below Ground
Gray Clay 14-81 Feet	
Glacial Till 81-88 Feet	Pump Intake During Testing 83.5 Feet Below Ground
Sand & Gravel 88-90 Feet	Bottom of Casing-89.5 Feet
Shale Bedrock 90-93 Feet	Sand & Gravel Backfill
	Bottom of Well-93 Feet Below Ground

FIVE RIVERS CONSERVATION EDUCATION CENTER
DELMAR, NEW YORK

24 HOUR CONTINUOUS YIELD TEST

STATIC LEVEL - 28'5" BELOW ORIGINAL GROUND

PUMP INTAKE - 83½' BELOW ORIGINAL GROUND

DATE	TIME	RATE (G.P.M.)	DYNAMIC LEVEL (FEET)	DRAWDOWN (FEET)	COMMENTS
4/19/74	8:30 AM	---	28'5" (STATIC)	---	Start pumping
	8:45 AM	15	45'3"	16'10"	Water cloudy
	9:00 AM	15	53'10"	25'5"	
	9:15 AM	15	56'6"	28'1"	
	9:30 AM	15	59'0"	30'7"	
	10:00 AM	15	61'11"	33'6"	
	10:30 AM	15	65'0"	36'7"	
	11:00 AM	15	66'11"	38'6"	
	11:15 AM	15-	66'9"	38'4"	Rate dropped - readjusted to 15 GPM
	11:30 AM	15	69'6"	41'1"	
	12:00 NOON	15	73'3½"	44'10½"	Water still cloudy
	12:30 PM	15	80'10"	52'5"	Closed valve - 12 GPM
	12:45 PM	12	73'0"	44'7"	Water level rising
	1:00 PM	12	70'8"	42'3"	Water clearing slowly
	1:30 PM	12	68'3"	39'10"	
	2:00 PM	12	68'2"	39'9"	
	2:30 PM	12	68'4"	39'11"	
	3:00 PM	12	68'1½"	39'8½"	
	3:30 PM	12	68'0"	39'7"	Took bacteriological sample
	4:00 PM	12	68'4"	39'11"	
	5:00 PM	12	68'6"	40'1"	
	5:40 PM	12-	---	---	Rate dropped slightly opened valve to 12 GPM
	6:00 PM	12	73'1"	44'8"	
	6:30 PM	12	76'2"	47'9"	
	6:45 PM	10	77'1"	48'8"	Closed valve to 10 GPM
	7:00 PM	10	76'8"	48'3"	
	7:15 PM	10	76'7"	48'2"	Closed valve
	8:00 PM	10-	77'5"	49'0"	Water clearing
	9:00 PM	10-	77'11"	49'6"	
	10:00 PM	10-	77'9"	49'4"	
	11:00 PM	10-	78'10"	50'5"	
	12:00 PM	10-	77'9"	49'4"	

DATE	TIME	RATE (G.P.M.)	DYNAMIC LEVEL (FEET)	DRAWDOWN (FEET)	COMMENTS
4/19/74	1:00 AM	7-7.5	65'6"	37'1"	
	2:00 AM	7-7.5	65'0"	36'7"	
	3:00 AM	7-7.5	65'11"	37'6"	
	4:00 AM	7-7.5	65'9"	37'4"	
	5:00 AM	7-7.5	65'9"	37'4"	
	6:00 AM	7-7.5	65'8"	37'3"	
	6:30 AM	7-7.5	65'0"	36'7"	Water Clear
	6:45 AM	10	---	---	Opened valve to 10 GPM
	7:00 AM	10	77'7"	49'2"	Water cloudy - closed valve
	7:30 AM	7-7.5	70'0"	41'7"	Water level rising - water clearing
	8:00 AM	7-7.5	68'1"	39'8"	
	8:30 AM	7-7.5	67'5"	39'0"	Water clear - took physical & chemical sample
END 24 HOUR TEST PERIOD					Stop pump
	8:30 AM	---	67'5"	39'0"	Recovery
				10'8"	
	8:35 AM	---	56'9"	28'4"	"
				10'4"	
	8:40 AM	---	46'5"	18'0"	"
				7'1"	
	8:45 AM	---	39'4"	10'11"	"
				5'5½"	
	8:50 AM	---	33'10½"	5'5½"	"
				1'3½"	
	8:55 AM	---	32'7"	4'2"	"
				10"	
	9:00 AM	---	31'9"	3'4"	"
				1'9"	
	1:00 PM	---	30'0"	1'7"	

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DELMAR, NEW YORK

ADDITIONAL TEST - 1

STATIC LEVEL - 28¼ FEET BELOW ORIGINAL GROUND

PUMP INTAKE - 83½ FEET BELOW ORIGINAL GROUND

DATE	TIME	RATE (G.P.M.)	DYNAMIC LEVEL (FEET)	DRAWDOWN (FEET)	COMMENTS
4/23/74	8:45 AM	---	28'3" (STATIC)	---	Start pumping
	9:00 AM	10	33'4"	5'1"	Water cloudy
	9:30 AM	10	34'4"	6'1"	Water clear
	10:00 AM	10	34'6½"	6'3½"	
	10:30 AM	10	34'9½"	6'6½"	
	11:00 AM	10-	34'9½"	6'6½"	Rate dropped - readjusted to 10 GPM
	11:30 AM	10	35'11"	7'8"	
	12:00 NOON	10	36'0"	7'9"	Water cloudy
	12:30 PM	10	36'5½"	8'2½"	Water clearing
	1:00 PM	10	36'8½"	8'5½"	
	1:30 PM	10	36'10"	8'7"	Water clear
	2:00 PM	10	36'10½"	8'7½"	
	2:30 PM	10	37'4"	9'1"	Water cloudy
	3:00 PM	10	37'6"	9'3"	Water clearing
	3:30 PM	10	37'8"	9'5"	Water clear
	3:45 PM	10	37'8"+	9'5"+	End pumping
	3:45 PM	---	37'8"+	9'5"+	Recovery
	3:50 PM	---	30'8½"	2'5½" 7'(+)	"
	3:55 PM	---	30'4"	2'1" 4½"	"
	4:00 PM	---	30'2½"	1'11½" 1½"	"
	4:05 PM	---	30'1½"	1'10½" 1"	"
	4:10 PM	---	30'½"	1'9½" 1"	"
	4:15 PM	---	30'0"	1'9" ½"	"

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DELMAR, NEW YORK

ADDITIONAL TEST - 2

STATIC LEVEL - 29 FEET BELOW ORIGINAL GROUND

PUMP INTAKE - 83½ FEET BELOW ORIGINAL GROUND

DATE	TIME	RATE (G.P.M.)	DYNAMIC LEVEL (FEET)	DRAWDOWN (FEET)	COMMENTS
4/24/74	10:30 AM	---	29'0" (STATIC)	---	Start pumping
	10:45 AM	15	43'6"	14'6"	Water cloudy
	11:00 AM	15	54'6½"	25'6½"	
	11:15 AM	15	61'7"	32'7"	
	11:30 AM	15	66'11"	37'11"	
	11:45 AM	15	70'5"	41'5"	
	12:00 NOON	15	74'2½"	45'2½"	
	12:05 PM	10	---	---	Closed valve to 10 GPM Water clearing
	12:15 PM	10	60'4"	31'4"	Water clear - water level rising
	12:26 PM	---	---	---	Generator failure

BENDER HYGIENIC LABORATORY
9 Samaritan Dr.
Albany, New York 12208

BACTERIOLOGICAL EXAMINATION OF WATER

(Submit a card for each bottle filled)

Laboratory number [illegible] Date collected APRIL 19 1974 Date received in lab [illegible]
Sample from Town of BETHLEHEM County of ALBANY Owner of supply N.Y.S. CONSERVATION
Tenant of property DEPT OF ENVIRONMENTAL CONSERV. Sampling Point WELL PUMP OUTLET
Separate chemical sample being submitted? Yes [X] No [ ] Date of previous sample NONE

WELL: Dug ☐ Drilled [X] Driven ☐ Depth of well 93 FEET Diameter 8 INCH
Type of cover ____ Curb ____ Casing CAP Depth of casing 89.5 FEET Type of pump SUBMERSIBLE

SPRING: Location: Steep slope ☐ Level ground ☐ Type of cover ____ Type of curb ____

Supply chlorinated when sampled: Yes ☐ ~~No~~ [X] Residual chlorine ____
Indicate whether surplus water pumped or surface drainage can enter the water supply NO
Any recent repairs? NO Construction: NO
State geologic character of surrounding soil CLAY OVER GRAVEL + ROCK
Identify all possible sources of pollution and indicate distance of each from the water supply NONE
(include privies, cesspools, septic tanks, tile fields, barnyards, fertilized areas)
Indicate whether water supply is involved in reported illness, if any NO

Signed Vance Bryant Title SR. ENGINEERING GEOLOGIST
Send report to: Dick [illegible] Inc Bill to: SAME
[illegible]
[illegible]

(DO NOT WRITE BELOW THIS LINE)

Examined by: RD Date 4/26/74
Bacteria per ml :agar 35°C–24 hrs. 1/ml
(~~Most Probable Number per 100~~ ml.)
Coliform Group: (Membrane Filter Colonies per 100 ml.) less than 1/100 ml.

These results indicate that the water was/~~was not~~ of a satisfactory sanitary quality when sampled. satisfactory
Remarks:

Ray Davis
Supervisor

REPORT II

Date Collected APRIL 20, 1974 Date Received 1974 APR 23 AM 10:28 Lab. No. 011694

BENDER HYGIENIC LABORATORY

9 Samaritan Dr., off Hackett Boulevard
Albany, N.Y. 12208

Water Sample — Chemical Examination

Samples from (check which) (City ____ (Village ____ (Township BETHLEHEM

County ALBANY

Owner of water supply NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION

Tenant of property FIVE RIVERS EDUCATIONAL CENTER

Sampling point WELL PUMP OUTLET (PIPE ORIFICE)

Separate bacteriologic sample being submitted? Yes X No ____

Date of last sample NONE

Supply chlorinated when sampled: Yes ____ No X

Residual chlorine NONE

Sample collected by Vance Bryant (Signature)

Title SENIOR ENGINEERING GEOLOGIST, NYS DoT (County Inspector, Owner, etc.)

Send Report to: NAME DICK FERRAIOLI INC
ADDRESS RD#1
ALTAMONT, N.Y. 12009

Bill to: NAME SAME
ADDRESS ____

RESULTS OF CHEMICAL EXAMINATION(*)

Color	5	units	Nitrate, as N	N.D.	mg/L
Turbidity	1.6	units	Nitrite, as N	N.D.	mg/L
Odor	0		Ammonia, as N	N.T.	mg/L
pH	7.8	units	Iron	0.2	mg/L
Alkalinity, as Ca CO_3			Manganese	N.D.	mg/L
Bicarbonate	326	mg/L	Fluoride	0.56	mg/L
Carbonate	N.D.	mg/L	Chemical Oxygen Demand	N.T.	mg/L
Hardness, as Ca CO_3	142	mg/L	MBAS (Surfactants)	N.T.	mg/L
Chloride	12	mg/L	Conductance	600	Micro Mhos
Sulfate	8	mg/L	Other		

(*) Additional analysis, if required, reported as Supplemental Chemical Analysis.

Abbreviations: N.D. — Not detected; N.T. — No test (not requested or insufficient sample); mg/L — Milligrams per Liter; < — "Less than"

Supervisor: [signature]

REPORT II

00970
LRI